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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,991	12/18/2000	Mikael Bisgaard-Bohr	9142	4291

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EXAMINER

PALADINI, ALBERT WILLIAM

ART UNIT PAPER NUMBER

2125

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/739,991	<b>Applicant(s)</b> BISGAARD-BOHR ET AL.	
	<b>Examiner</b> Albert W Paladini	<b>Art Unit</b> 2125	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/18/01</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

According to lines 20-23 on page 8, box 302 is a Gaussian Mixture Model algorithm, which creates data model 200. However, according to the description of figure 2 from page 7 line 27 to page 8, line 14, element 200 contains three data bases where information about purchased items, transaction sales, and aggregate data is stored. There is no description of how a Gaussian Mixture Algorithm is applied or utilized. Gaussian Mixture Algorithms generally model overlapping individual Gaussian distributions. In this instance, three sets of stored information or data are said to represent a Gaussian Mixture model. The actual application of the statistical tool is not explained, and the result appears to be only tables of accumulated transaction data. Since the Gaussian Mixture Model is recited in all of the base claims, its use and application must be described in the specification.

Appropriate correction and clarification is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claim 1-3 and 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

#### **Claim 1**

Lines 4-5 recite, "wherein the data model comprises a Gaussian Mixture Model that stores transactional data." A model is not a storage device and its function is not to store data. A model contains mathematical or conceptual elements that contain relationships in the form of equations, verbal descriptions, etc.; which relates two or more sets of data. For example, a falling object may be described in terms of the mathematics of velocity and acceleration. This recitation describes the storage of real world data. Although the data may represent some characteristics of the real world, it is not understood how a Gaussian Mixture is applied.

Lines 6-7 recite "mapping the data model in the computer-implemented mining system to aggregate the transactional data for cluster analysis." The recitation does not provide an object to receive the mapping. What is the data model mapped into or onto?

#### **Claim 7**

Lines 4-5 recite, "wherein the data model comprises a Gaussian Mixture Model that stores transactional data." A model is not a storage device and its function is not to store data. A model contains mathematical or conceptual elements that contain relationships in the form of equations, verbal descriptions, etc.; which relates two or more sets of data. For example, a falling object may be described in terms of the mathematics of velocity and acceleration. This recitation describes the storage of real world data. Although the data may represent some characteristics of the real world, it is not understood how a Gaussian Mixture is applied.

Lines 6-7 recite "mapping the data model in the computer-implemented mining system to aggregate the transactional data for cluster analysis." The recitation does not provide an object to receive the mapping. What is the data model mapped into or onto?

5. Claims 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

#### **Claim 4**

The recitation suggests two elements, "a computer," and "logic, performed by the computer." "Logic" is not a separate element, but describes the functional operation of the computer.

Lines 5-6 recite, "generating a data model, wherein the data model comprises a Gaussian Mixture model that stores transactional data." A model is not a storage device and its function is not to store data. A model contains mathematical or conceptual elements that contain relationships in the form of equations, verbal descriptions, etc.; which relates two or more sets of data. For example, a falling object may be described in terms of the mathematics of velocity and acceleration. This recitation describes the storage of real world data. Although the data may represent some characteristics of the real world, it is not understood how a Gaussian Mixture is applied.

Lines 7-8 recite, "mapping the data model to aggregate the transactional data for cluster analysis." The recitation does not provide an object to receive the mapping. What is the data model mapped into or onto?

Appropriate correction and clarification is required.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Fayyad.

This rejection is made to the extent that the claims are understood.

In step 120 in figure 4, Fayyad performs a clustering analysis, which involves a Gaussian Mixture Model to perform automated analysis of large databases to extract useful

information such as models or predictors from data stored in the database. One of the primary operations in data mining is clustering (also known as database segmentation). One of the most well known algorithms for probabilistic clustering of a database with both discrete and continuous attributes is the Expectation-Maximization (EM) algorithm applied to a Multinomial/Gaussian mixture.

### ***Relevant Prior Art***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fayyad (6263337) discloses a method, which assigns data points to Gaussians in a probabilistic fashion. Two different techniques are proposed for determining the integer N, the number of singleton data points over which the Gaussian mean is computed. The first way is motivated by the EM Gaussian center update formula, which is computed over all of the data, processed so far (whether it has been compressed or not), hence in the first variant of the Bonferroni CI computation N is taken to be the number of data elements processed by the Scalable EM algorithm so far. The second variant is motivated by the fact that although the EM Gaussian center update is over all data points, each data point is assigned probabilistically to a given Gaussian in the mixture model, hence in the second variant of the Bonferroni computations N is taken to be the rounded integer of the sum of the probabilistic assignments over all data points processed so far.

Chen (6591235) discloses an invention directed to methods for high dimensional data mining and visualization via Gaussianization. These methods are premised upon a method

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referred to herein as "Gaussianization", which transforms high dimensional data into a standard Gaussian distribution. The Gaussianization method is an iterative method that converges. Moreover, an iterative expectation maximization (EM) method is provided herein which increases the auxiliary function Q of the EM method with each iteration. The EM method of the invention may be advantageously employed in the Gaussianization method of the invention to obtain convergence.

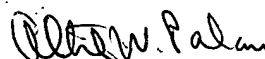
Hildreth (6816848) discloses an algorithm for cluster analysis of mining data where in the preferred embodiment, only two of the many types of cluster analysis are described: (1) a K-Means model, and (2) a Gaussian Mixture model, both of which are implemented via an Expectation-Maximization (EM) algorithm. The EM algorithm is superior to other methods for statistical modeling, and readily admits categorical and continuous attributes. Of course, those skilled in the art will recognize that other types of cluster analysis and other algorithms could be used without departing from the scope of the present invention.

9. Any inquiry concerning this communication or earlier communication from the examiner should be direct to Albert W. Paladini whose telephone number is (572) 272-3748. The examiner can normally be reached from 7:30 to 3:30 PM on Monday, Tuesday, Thursday, and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Leo P. Picard, can be reached on (572) 272-3749. The official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

November 23, 2004

  
Albert W. Paladini  
Primary Examiner  
Art Unit 2125